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The Impact of PLN Mobile's Meter Recording Feature Implementation on Customer Satisfaction in Postpaid Electricity Services

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Abstract. This research examines the impact of the meter reading feature in the PLN Mobile application on customer satisfaction by employing the Technology Acceptance Model (TAM) integrated with TRUST as a mediating variable. A total of 102 active postpaid customers participated in an online survey using a 5-point Likert scale. Data were analysed using PLS-SEM through validity, reliability, discriminant, and bootstrapping tests. The findings reveal that Perceived Ease of Use (PEOU) significantly influences both Perceived Usefulness (PU) and Customer Satisfaction (CS), making it the most dominant driver of user experience. PU also demonstrates a significant effect on CS and strongly predicts TRUST, showing that perceived benefits strengthen confidence in system reliability. TRUST significantly contributes to CS and serves as a partial mediator in the relationship between PU and CS. These results extend TAM by confirming the strategic role of TRUST within mandatory public utility services. Practically, the study highlights the importance of enhancing usability, functional benefits, and perceived system integrity to improve customer satisfaction with PLN Mobile.

Keywords: Meter Reading; Customer Satisfaction; PLN Mobile; TAM; TRUST.

INTRODUCTION

Digital transformation in Indonesia's public services sector has accelerated rapidly in recent years. PT PLN (Persero), the national electricity provider, has responded to this shift by developing the PLN Mobile application, designed to provide faster, more transparent, and more accessible electricity services (Adha et al., 2025; Kusuma & Rahim, 2021; Rahayu et al., 2024; Saing, 2024). The app's presence marks a shift in how customers interact with electricity services, from a manual process dependent on officers to a more independent and digital system.

Since its launch in 2020, PLN Mobile has steadily evolved into an integrated electricity service platform, offering a range of features—from complaints, token purchases, new installation requests, and power changes to a Meter Reading feature for postpaid customers. Through the Meter Reading feature, customers can independently report their meter readings each month. This concept not only provides customers with greater control but also supports PLN's operational efficiency, particularly in the manual meter reading process, which has traditionally relied on field officers.

For example, based on July 2025 data, PLN UP3 Tanah Bumbu served 75,504 postpaid non-Automatic Meter Reading (AMR) customers. All customers in this category still require manual meter reading by staff or through self-reporting using the Meter Recording feature in the PLN Mobile app (Eka et al., 2022; Janthong et al., 2023; Rüstemli et al., 2025; Surusa et al., 2022). This large number of non-AMR customers demonstrates that the meter reading process is a crucial operational activity with direct implications for billing accuracy, operational efficiency, and customer satisfaction. PLN UP3 Tanah Bumbu is a customer service unit of PT PLN (Persero) located in Tanah Bumbu Regency. In carrying out its functions, PLN UP3 Tanah Bumbu oversees three Customer Service Units (ULP): ULP Kotabaru Kota, ULP Batulicin,

and ULP Satui. These three ULPs serve customers with diverse regional and demographic characteristics, including developing residential areas in the regency, mining centers, coastal areas, and areas with relatively sparse settlements.

However, on-the-ground data demonstrates a significant gap between the potential benefits of the Meter Recording feature and its actual adoption rate. At PLN UP3 Tanah Bumbu, out of 75,504 postpaid customers, only around 200–300 utilize the Meter Recording feature consistently. This figure reflects that most customers do not yet understand or experience the benefits of this feature, even though it is technically capable of providing bill transparency, more accurate consumption monitoring, and better energy control.

The challenge became even more apparent in early 2025, when there was an increase in customer complaints regarding postpaid electricity bills following the end of the government's 10% tariff discount program. Many customers felt their bills had "surged," even though increased electricity consumption during Ramadan and changes in household activity patterns were the main factors. Customers' lack of understanding of energy consumption patterns makes it difficult to predict bills. At this point, the Meter Recording feature could provide better visibility into monthly electricity usage, but low customer participation prevents this benefit from being optimal.

In the context of technology user behavior, the phenomenon of low Meter Recording utilization can be analyzed using the Technology Acceptance Model (TAM) framework. This model explains that technology acceptance is highly dependent on perceived ease of use (PEOU) and perceived usefulness (PU) (Katebi et al., 2022; Lee et al., 2025; Na et al., 2022; Widuri, 2022). In digital-based public services like PLN Mobile, trust (TRUST) plays a crucial role because customers need assurance that the meter data they submit is processed securely, accurately, and transparently. This trust then influences customer satisfaction with PLN's digital services.

Previous research has explored various aspects of technology adoption in utility services. Studies by Davis (1989) and Venkatesh & Bala (2008) have consistently shown that PEOU and PU are key determinants of technology acceptance. In the context of digital public services, research by Zhang et al. (2023) found that perceived usefulness significantly influences user satisfaction in digital utility platforms. Similarly, Tan et al. (2021) demonstrated that system usefulness directly contributes to user satisfaction evaluations in postpaid utility services in Southeast Asia. Furthermore, research by Gefen et al. (2003) and Susanto et al. (2021) has highlighted the critical role of trust in technology adoption, particularly in contexts involving sensitive data such as utility billing information.

However, few studies have specifically examined the integrated relationship between PEOU, PU, trust, and customer satisfaction within the context of mandatory digital services in public utilities, particularly in developing countries like Indonesia. Most existing research has focused on voluntary technology adoption in commercial contexts, with limited attention to mandatory or essential public services where usage may not be entirely discretionary. Additionally, while trust has been recognized as important, its mediating role between perceived usefulness and customer satisfaction in the specific context of electricity service applications remains underexplored. This research gap is particularly relevant for PLN Mobile's Meter Recording feature, which represents a mandatory-use digital service within an essential public utility context. Unlike voluntary consumer applications, customers must

engage with this feature for accurate billing, creating a unique dynamic where perceived ease of use and usefulness may interact differently with trust and satisfaction.

Therefore, this study was conducted to understand how PEOU, PU, and TRUST shape customer satisfaction among users of the Meter Recording feature. This research is expected to provide an empirical overview of customer behavior in using PLN's digital features, while also providing strategic input for PLN in improving service quality and encouraging customer engagement in independent energy consumption monitoring.

MATERIALS AND METHODS

This research was an explanatory quantitative study that aimed to analyze the effect of the implementation of the *Catat Meter* feature on the PLN Mobile application on the level of customer satisfaction. The research population included all active users of the PLN Mobile application who had used the *Catat Meter* feature, with a minimum sample of 100 respondents determined using the Slovin formula with a 5% error rate. The sampling technique was purposive sampling with the criteria of respondents who had used the feature at least once in the last three months and had experience using the application for at least one month. Data collection was conducted through an online questionnaire using a 5-point Likert scale distributed via Google Forms directly to customers. The research instrument measured two independent variables: Perception of Ease of Use (PEOU), which included ease of navigation, simplicity of data input, system stability, ease of access to assistance, and interface compatibility with devices; and Perception of Usefulness (PU), which included time efficiency, ease of consumption monitoring, and data accuracy. The dependent variable, Customer Satisfaction (CS), was measured through five aspects: feature speed, system reliability, satisfaction with the overall features offered, and continuance intention. Meanwhile, the TRUST variable was measured through confidence in data integrity and perception of privacy security. These indicators were designed to capture critical aspects that influenced customer trust in the *Catat Meter* feature. In this context, TRUST not only served as an independent variable but also as a mediating variable that bridged the influence between PU and customer satisfaction.

After formulating the research variables and indicators, Table 1 presented the theoretical constructs that formed the basis of the measurements in this study. Each indicator was selected based on established literature in the field of technology adoption and digital services, ensuring that all variables had a strong conceptual foundation. The PEOU indicators were designed to describe the user experience when interacting with the *Catat Meter* feature, from application navigation to system stability. Meanwhile, the PU indicators focused on tangible benefits perceived by customers, such as time efficiency, data accuracy, and ease of monitoring electricity consumption.

The TRUST variable was measured through indicators that reflected customer confidence in the security, integrity, and reliability of PLN Mobile's digital system—crucial factors in the context of data-based public services. The Customer Satisfaction (CS) construct was designed to reflect customers' overall evaluation of the *Catat Meter* feature, encompassing service speed, application reliability, and intention to continue using the service. With its

comprehensive and complementary indicator structure, this research model accurately captured the factors influencing customer satisfaction with the *Catat Meter* feature.

Data analysis in this study was conducted in stages using a Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach. This process began with an evaluation of the measurement model to ensure that each indicator had an adequate level of validity and reliability. Once the measurement model was deemed appropriate, the analysis continued with the structural model to examine how variables such as PEOU, PU, TRUST, and CS influenced each other. This approach was chosen because it could handle complex research models with a limited number of samples, while providing more flexible estimation results in the context of digital services such as PLN Mobile. Before estimating the structural model, the researcher first conducted the evaluation stage of the measurement model, which included a convergent validity test (seen from outer loading values ≥ 0.70), a construct reliability test (using Cronbach's Alpha and Composite Reliability [CR] ≥ 0.70), and a discriminant validity test (using the Heterotrait-Monotrait Ratio [HTMT] < 0.90).

Table 1. Outer Loadings – Matrix

	CS	PEOU	PU	TRUST
CS1	0.788			
CS2	0.863			
CS3	0.778			
CS4	0.810			
CS5	0.825			
CS6	0.868			
CS7	0.808			
PEOU1		0.755		
PEOU2		0.751		
PEOU3		0.760		
PEOU4		0.753		
PEOU5		0.965		
PEOU6		0.807		
PEOU7		0.822		
PU1			0.830	
PU2			0.770	
PU3			0.757	
PU4			0.898	
TRUST1				0.838
TRUST2				0.776
TRUST3				0.776
TRUST4				0.801

Source: Primary survey data collected via Google Forms, 2025

Based on the results of data processing using SmartPLS, all variables show Cronbach's Alpha and Composite Reliability (rho_A and rho_C) values that are above the minimum limit of 0.70, with the value of each variable ranging from 0.810 to 0.935. This confirms that all

constructs have strong internal consistency and reliability in measuring latent variables. In addition, the Average Variance Extracted (AVE) values for all variables are also above the standard of 0.50, namely CS (0.674), PEOU (0.648), PU (0.665), and TRUST (0.637). This condition indicates that the indicators in each construct can explain a large portion of the construct variance adequately so that they have met the criteria of convergent validity.

Table 2. Results of Reliability and Validity Tests

	Cronbach's alpha	composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CS	0.919	0.923	0.935	0.674
PEOU	0.908	0.919	0.927	0.648
PU	0.831	0.842	0.888	0.665
TRUST	0.810	0.815	0.875	0.637

Source: SmartPLS 4.0 analysis output. All values meet acceptable thresholds (α & CR > 0.70; AVE > 0.50)

Table 3. Results of Discriminant Test (HTMT)

	CS	PEOU	PU	TRUST
CS				
PEOU	0.831			
PU	0.813	0.730		
TRUST	0.855	0.783	0.855	

Source: SmartPLS 4.0 analysis using Heterotrait-Monotrait Ratio (HTMT). All values < 0.90, confirming discriminant validity

Next, discriminant validity was tested using the High-Trait-Monotrait Ratio (HTMT) approach. The test results showed that all HTMT values were below the maximum limit of 0.90, with values ranging from 0.730 to 0.855. Although some values were in a relatively high range, all remained within the tolerance limits of the PLS-SEM literature. This reflects that each construct has clear conceptual differences and there is no overlap between variables.

Thus, the results of the overall reliability, convergent validity, and discriminant validity tests indicate that the measurement model used in this study has met all eligibility criteria. The construct is stated to be stable, accurate, and able to represent the research variables precisely, so that it is suitable for use in the structural model analysis process at the next stage.

RESULTS AND DISCUSSION

This study involved 111 respondents, postpaid customers of PLN UP3 Tanah Bumbu, who had used the Record Metrics feature in the PLN Mobile application. All respondents were obtained through an online questionnaire using Google Forms.

Table 4. Respondent Characteristics

No	Characteristics	Category	Percentage (%)
1	Gender	Male	41.44
		Female	58.56
2	Age	< 20 years	4.50

No	Characteristics	Category	Percentage (%)
		20 – 30 years	23.42
		30 – 40 years	39.64
		> 40 years	32.43
3	Final Education	Elementary / Middle	5.42
		Senior High School / Equivalent	48.65
		Diploma/Bachelor's Degree	42.34
		Master's Degree or Higher	3.60
4	Jobs	Private Sector	32.43
		Housewife	24.32
		Self-employed	16.22
		Civil Servant/State-Owned Enterprise	16.22
		Other	7.81
		Student / College Student	3.60
5	Source of Information	Social Media	36.04
		PLN Socialization	37.84
		Friends / Family	26.13

Source: Primary data from online survey conducted via Google Forms, 2025

Based on the results of data collection, the majority of respondents in this study were female (58.56%) and were in the productive adult age range, especially the 30–40 year old group (39.64%) and over 40 years old (32.43%). Most of them had a high school/secondary education level (48.65%) and a diploma/bachelor's degree (42.34%), indicating that users of the *Catat Meter* feature were dominated by individuals with a fairly good level of digital literacy. From the employment aspect, most respondents came from the private sector (32.43%) and housewives (24.32%), with a significant proportion also from self-employed individuals and civil servants/state-owned enterprises/regional-owned enterprises. The primary source of information regarding the Record Meter feature was obtained through official PLN socialization (37.84%) and social media (36.04%), indicating that formal and digital communication were the most effective channels in introducing this feature to customers.

After the measurement model was declared valid and reliable, the next step was to evaluate the structural model to determine the strength and direction of the relationships between the latent variables. Testing was conducted through bootstrapping analysis with 5,000 resamplings. In general, all relationship paths showed T-statistics above 1.96 and p-values below 0.05, thus concluding that all research hypotheses were accepted.

Table 6. Bootstrapping Analysis Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
PEOU -> CS	0.406	0.416	0.099	4.078	0.000
PEOU -> PU	0.653	0.653	0.061	10.648	0.000
PU -> CS	0.271	0.263	0.099	2.736	0.006
PU -> TRUST	0.713	0.710	0.063	11.321	0.000
TRUST -> CS	0.276	0.273	0.100	2.745	0.006

1. The Influence of PEOU → CS (O = 0.406, p = 0.000)

The results of this study indicate that the application's ease of use has a positive and significant impact on customer satisfaction. This means that the easier the Record Meter feature is to operate—whether in terms of navigation, system stability, or input simplification—the higher the level of user satisfaction. This finding aligns with research by Davis (1989), which asserted that perceived ease of use increases user acceptance and experience of technology. These results are also consistent with those of Zhang et al. (2023), who found that ease of use is a direct predictor of satisfaction with public utility applications.

2. Influence of PEOU → PU (O = 0.653, p = 0.000)

Ease of use was shown to have the strongest influence on perceived usefulness. An intuitive and easy-to-use application makes it easier for customers to perceive the value of the Record My Account feature. This finding aligns with the TAM model (Davis, 1989) and is supported by Venkatesh & Bala (2008), who showed that perceived ease of use is a fundamental predictor in increasing perceived usefulness of digital technology.

3. Effect of PU → CS (0 = 0.271, p = 0.006)

Perceived usefulness has a positive and significant effect on customer satisfaction. Users reported greater satisfaction when the Record Metrics feature provided time efficiency, bill transparency, and ease of monitoring electricity consumption. These results align with those of Zhang et al. (2023), who found that perceived usefulness is a strong predictor of customer satisfaction with public service applications. This finding is also consistent with the research of Tan et al. (2021) on postpaid services in Malaysia, which showed that system usefulness directly contributes to user satisfaction evaluations.

4. Influence of PU → TRUST (0 = 0.713, p = 0.000)

Perceived benefits have been shown to have a strong influence on user trust. When the application is perceived to provide real and accurate benefits, customers have greater confidence in the data integrity and reliability of the PLN Mobile digital system. This finding is consistent with Gefen et al. (2003), who stated that perceived benefits can increase trust in electronic systems. Furthermore, these results align with those of Susanto et al. (2021), who found that data accuracy and system usability play a crucial role in building trust in government digital services.

5. Influence of Trust → Customer Satisfaction (0 = 0.276, p = 0.006)

Trust has been shown to have a positive and significant impact on customer satisfaction. Users who trust data security and the accuracy of meter readings will be more satisfied with PLN's digital services. These results align with the findings of McKnight et al. (2002), who explained that trust strengthens users' positive evaluations of technology-based applications. Furthermore, these findings align with those of Mayer et al. (1995), who asserted that trust is a crucial psychological factor influencing users' assessments of service quality.

6. The Mediating Role of TRUST

Based on the bootstrapping results, TRUST was shown to significantly mediate the relationship between PU and CS, as both the PU → TRUST and TRUST → CS paths were significant. This indicates that PU's influence on customer satisfaction partially occurs through increased trust. This finding aligns with research by Zhang et al. (2023), which showed that

TRUST strengthens the relationship between usefulness and satisfaction in digital utility services in developing countries. This result also supports the mediation model of Gìefien et al. (2003) which places TRUST as an important bridge in the process of determining satisfaction in technology-based services.

CONCLUSION

This study deepened understanding of customer perceptions of the *Catat Meter* feature in the PLN Mobile application, using PLS-SEM to validate all constructs as reliable and valid. Findings revealed that perceived ease of use (PEOU) was the strongest influencer, enhancing perceived usefulness (PU) by making navigation and stability intuitive, aligning with the Technology Acceptance Model (TAM). PU drove customer satisfaction through transparency, time efficiency, and consumption control, while also fostering trust in PLN's secure, accurate services. Trust mediated the PU-satisfaction link, highlighting emotional factors like security alongside technical ones, urging PLN to prioritize user-centric digital development for Indonesia's electricity sector transformation. For future research, longitudinal studies could track sustained *Catat Meter* adoption post-implementation, incorporating qualitative insights from non-users in rural areas to address adoption barriers and refine trust-building strategies.

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